Progress Energy

January 10, 2007

SERIAL: BSEP 07-0007 10 CFR 50.73

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Subject: Brunswick Steam Electric Plant, Unit No. 2
Docket No. 50-324/License No. DPR-62
Licensee Event Report 2-2006-002

Ladies and Gentlemen:

In accordance with the Code of Federal Regulations, Title 10, Part 50.73, Carolina Power & Light Company, now doing business as Progress Energy Carolinas, Inc., submits the enclosed Licensee Event Report.

Please refer any questions regarding this submittal to Mr. Randy C. Ivey, Manager – Support Services, at (910) 457-2447.

Sincerely,

B. C. Waldrep
Plant General Manager
Brunswick Steam Electric Plant

TMS/tms

Enclosure:

Licensee Event Report

Progress Energy Carolinas, Inc.
Brunswick Nuclear Plant
P.O. Box 10429
Southport, NC 28461

IE22

cc (with enclosure):

U. S. Nuclear Regulatory Commission, Region II
ATTN: Dr. William D. Travers, Regional Administrator
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NRC FORM 366 (6-2004) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2007

Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to the information collection.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
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4. TITLE

Manual Scram Due To Conductivity Increase

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
11	11	2006	2006	-- 002 --	00	1	10	2007	FACILITY NAME	DOCKET NUMBER 05000

9. OPERATING MODE

2

10. POWER LEVEL

1%

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more)

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☒ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER Specify in Abstract below or in NRC Form 366A
☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
Thomas M. Sherrill, Sr. Technical Specialist - Licensing	(910) 457-2703

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED				15. EXPECTED SUBMISSION DATE	MO	DAY	YEAR
	YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

At 1243 EST on November 11, 2006, with the reactor critical and in Mode 2 for startup activities, high conductivity in the condenser resulted in initiation of a manual Reactor Protection System actuation. All control rods properly inserted when the manual reactor scram was performed. No emergency core cooling systems (ECCS) actuated. At the time of the conductivity excursion, the condensate/feedwater system was not feeding the vessel, thus the reactor water chemistry was not adversely affected.

This event is being reported in accordance with 10 CFR 50.73(a)(2)(iv)(A), as an event or condition that resulted in manual or automatic actuation of any of the systems listed in 10 CFR 50.73(a)(2)(iv)(B).

The high conductivity in the condenser was determined to be the result of missing plugs on 165 condenser tubes, of which 17 of the tubes were found leaking (i.e., existing tube leaks reopened). The root cause is the failure to have procedural guidance to inspect the condenser water boxes for missing tube plugs following a Loss Of Offsite Power (LOOP) event. Corrective actions included reinstalling the missing plugs and checking all plugs for tightness.

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NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

Energy Industry Identification System (EIIS) codes are identified in the text as [XX].

Introduction

On November 11, 2006, a manual reactor scram was initiated on Unit 2 due to high conductivity in the condenser [SG]. The reactor was in Mode 2 for startup activities at the time of the event. Subsequent to the scram, the condenser water boxes were secured and opened for inspection. Station personnel found condenser tube plugs missing from 165 previously plugged tubes. It was determined that 17 of the condenser tubes were leaking, providing the source for saltwater intrusion of the Circulating Water system into the Condensate system [SD]. The missing plugs were reinstalled and the unit was returned to service on November 20, 2006.

This event is being reported in accordance with 10 CFR 50.73(a)(2)(iv)(A), as an event or condition that resulted in manual or automatic actuation of any of the systems listed in 10 CFR 50.73(a)(2)(iv)(B) (i.e., Reactor Protection system [JC]).

Event Description

Initial Conditions

At the time the condition was identified , Unit 2 was in Mode 2, at approximately 1% of thermal rated power.

Discussion

On November 1, 2006, Unit 2 experienced a loss of the units Startup Auxiliary Transformer (SAT) [EA] and an associated loss of the Reactor Recirculation pumps [AD]. A manual reactor scram was performed, and due to the loss of the SAT and resultant scram, a Loss Of Offsite Power (LOOP) occurred. The LOOP de-energized plant equipment including electrical busses 2C and 2D, which resulted in a loss of the Circulating Water pumps. Circulating Water flow through the Unit 2 condenser waterboxes was lost.

On November 11, 2006, during plant startup, and as condenser vacuum was being established, Unit 2 experienced rapidly increasing condenser conductivity readings for the 2A North and 2B North hotwells. After entering Abnormal Operating Procedures, conductivity levels remained high, and at 1243 EST, a manual reactor scram was initiated. After Unit 2 entered cold shutdown, the condenser waterboxes were opened for inspection. The inspection identified 165 condenser tubes with missing plugs. Pressure testing of individual condenser tubes was performed on those tubes with missing plugs to validate the integrity of the tubes. It was determined that 17 condenser tubes that had missing plugs failed the pressure test. The condenser tubes that failed the pressure test had indications or damage that allowed water from the Circulating Water system (i.e., salt water) to intrude into the water of the Condensate system. The intrusion of the circulating water into the condenser through unplugged defective tubes provided the source of the conductivity excursion experienced during the Unit 2 startup.

Event Cause

The root cause of this event is the failure to have procedural guidance to inspect the condenser water boxes for missing tube plugs following a LOOP event.

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NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

Event Cause (Continued)

A contributing cause of the conductivity excursion is that the design of the existing condenser tube plugs is insufficient to withstand the thermal transient forces caused during a LOOP event from full power. The thermal transient loading caused a build-up of pressure inside the plugged tubes when cooling water flow through the condenser was lost. When vacuum was drawn on the condenser, the Circulating Water was sucked through the unplugged, defective tubes into the condenser hotwells where it was processed through the Condensate system.

Safety Assessment

The safety significance of this event is considered minimal.

The conductivity excursion (i.e., high chlorides) going through the Condensate system caused four Condensate Deepbed Demineralizer resin beds to be depleted. New resin was required. The condensate system was placed in cleanup for several days while the conductivity was removed from the system. There was no adverse consequence (i.e., dose or personnel safety) to plant personnel.

Corrective Actions

The missing condenser tube plugs have been replaced.

The following corrective actions to prevent recurrence have been established as a result of this event.

1. Plant procedure 0OI-01.06, "Post Trip Review" will be revised to provide guidance that condenser tube plugs may be expelled during a LOOP with a loss of condenser vacuum and loss of Circulating Water flow at power and that a water box inspection should be performed for missing tube plugs. This is currently scheduled to be completed by March 15, 2007.
2. A new condenser tube plug design rated for a higher pressure (1,000 psi vs. 100 psi) will be selected for future condenser tube leaks. This is currently scheduled to be completed by February 16, 2007.
3. Replacement of the existing tube plugs in the Unit 2 condenser water boxes, with the new tube plugs will be performed in the following:
   1) Top three rows of each tube bundle.
   2) Tubes with identified leaks.
   3) Tubes not meeting eddy current testing acceptance criteria.

   This is currently scheduled to be completed during the B218R1 refueling outage currently scheduled to begin in March 2007.
4. Replacement of the existing tube plugs in the Unit 1 condenser water boxes, with the new tube plugs will be performed in the following:
   1) Top three rows of each tube bundle.
   2) Tubes with identified leaks.
   3) Tubes not meeting eddy current testing acceptance criteria.

   This is currently scheduled to be completed during the B117R1 refueling outage currently scheduled to begin in March 2008.

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NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

Previous Similar Events

A review of LERs and corrective action program condition reports for the past three years identified the following similar event at BSEP.

Nuclear Condition Report (NCR) 135131

On August 18, 2004 at 2138 EST, during power ascension following a shutdown initiated by a loss of offsite power, the presence of a condenser tube leak was observed when elevated chloride levels from the 1A North waterbox (i.e., 50 ppb) and the condensate discharge header (i.e., 13.7 ppb) were recorded. A Unit 1 downpower to 53% was made to identify the location of the leak and perform immediate corrective actions in the form of plugging 95 tubes identified with missing plugs. The long term corrective action of the NCR as a result of this event was to generate a preventive maintenance task to tighten the tube plugs each refueling outage. This has been determined to be an inadequate corrective action.

Commitments

No regulatory commitments are contained in this report.